

Appendix J

Common Riparian Plant Species on BLM-Administered Lands in the SDFO RMP Planning Area and Common Ecological Sites and Plant Communities

<i>Grasses and Grasslike</i>	<i>Sedges and Rushes</i>	<i>Forbs</i>	<i>Shrubs</i>	<i>Trees</i>
Alkali sacaton (<i>Sporobolus airoides</i>)	Alkali bulrush (<i>Scripus maritimus</i>)	American licorice (<i>Glycyrrhiza lepidota</i>)	Sandbar willow (<i>Salix exigua</i>)	Boxelder (<i>Acer negundo</i>)
Inland saltgrass (<i>Distichlis spicata</i>)	Baltic rush (<i>Juncus balticus</i>)	Annual sunflower (<i>Helianthus annuus</i>)	Chokecherry (<i>Prunus virginiana</i>)	Green ash (<i>Fraxinus pennsylvanica</i>)
Bluejoint reedgrass (<i>Calamagrostis canadensis</i>)	Beaked sedge (<i>Carex rostrata</i>)	Cocklebur (<i>Xanthium strumarium</i>)	Yellow willow (<i>salix lutea</i>)	Narrowleaf cottonwood (<i>Populus angustifolia</i>)
Canada wildrye (<i>Elymus canadensis</i>)	Creeping spikerush (<i>Eleocharis palustris</i>)	Duck potato (<i>Sagittaria latifolia</i>)	Golden current (<i>Ribes aureum</i>)	Plains cottonwood (<i>Populus deltoides</i>)
Foxtail barley (<i>Hordeum jubatum</i>)	Hardstem bulrush (<i>Scripus acutus</i>)	Poison hemlock (<i>Conium maculatum</i>)	Gooseberry (<i>Ribes lacustre</i>)	American elm (<i>Ulmus Americana</i>)
Nuttall alkali grass (<i>Puccinellia nuttalliana</i>)	Dudley rush (<i>Juncus dudleyi</i>)	Marsh smartweed (<i>Polygonum coccineum</i>)	Redosier dogwood (<i>Cornus stolonifera</i>)	
Prairie cordgrass (<i>Spartina pectinata</i>)	Softstem bulrush (<i>Schoenoplectus tabernaemontani</i>)	Sheep sorrel (<i>Rumex acetosella</i>)	Rose (<i>Rosa woodsii</i>) Wild rose (<i>Rosa arkansana</i>)	
Kentucky bluegrass (<i>Poa pratensis</i>)		Curled Dock (<i>Rumex crispus</i>)	Buffaloberry (<i>Shepherdia</i>)	
		Canada thistle (<i>Cirsium Arvense</i>)	Snowberry (<i>Symphoricarpos occid</i>)	

Common Ecological Sites in the Planning Area

Clayey Ecological Site

Ecological Dynamics of the Site

This site developed under Northern Great Plains climatic conditions, natural influences of large herbivores, occasional fire, and other biotic and abiotic factors that typically influence soil/site development. Changes will occur in the plant communities due to short-term weather variations, impacts of native and/or exotic plant and animal species, and management actions. While the following plant community descriptions describe more typical transitions between communities that will occur, severe disturbances, such as periods of well-below average precipitation, can cause significant shifts in plant communities and/or species composition.

Black greasewood, ponderosa pine, Rocky Mountain juniper, eastern red cedar and bur oak occur in small amounts on several sites in the MLRA. These same species may encroach into associated sites, changing site characteristics. These shifts can alter site dynamics and potential.

The plant community upon which interpretations are primarily based is the Historic Climax Plant Community (HCPC). The HCPC has been determined by studying rangeland relic areas, areas protected from excessive disturbance, and areas under long-term rotational grazing regimes. Trends in plant community dynamics ranging from heavily grazed to lightly grazed areas, seasonal use pastures, and historical accounts also have been used. Plant communities, states, transitional pathways, and thresholds have been determined through similar studies and experience.

The following diagram illustrates the common plant communities and vegetation states commonly occurring on the site and the transition pathways between communities and states.

Plant Communities of the Site

Western Wheatgrass/Green Needlegrass

The plant community upon which interpretations are primarily based is the Western Wheatgrass/Green Needlegrass Plant

Community. This is also considered the Historic Climax Plant Community (HCPC). This plant community can be found on areas that are properly managed with grazing and/or prescribed burning, and on areas receiving occasional short periods of deferment.

The potential vegetation is about 80-90% grasses or grass-like plants, 5-10% forbs, and 5-10% shrubs. Cool season grasses dominate this plant community. The major grasses are western wheatgrass and green needlegrass. Other graminoids include blue grama, buffalograss, sideoats grama, prairie junegrass and sedge. Significant forbs include scarlet globemallow, wild parsley, biscuitroot, golden pea, sego lily, deervetch, American vetch, and milkvetch. Significant shrubs that occur include big sagebrush, cactus, winterfat, rose and fourwing saltbush.

Big Sagebrush/Western Wheatgrass

This plant community develops from continuous season long grazing and the absence of fire. It will also develop with

extended periods of non-use and lack of fire. Sagebrush will typically increase whenever the vigor of the perennial herbaceous vegetation is reduced and fire is absent. This plant community is made up of 65-80% mid cool season and short warm season grasses, 5-10% forbs, and 15-25% shrubs. The dominant grasses include western wheatgrass, green needlegrass, blue grama and buffalograss. As conditions deteriorate, desirable species are replaced by big sagebrush. Blue grama, buffalograss, prairie junegrass and Sandberg bluegrass increase in the plant community. Annual brome, other annuals, and Kentucky bluegrass can invade the plant community.

Western Wheatgrass/Blue Grama/Buffalograss

This plant community develops under continuous seasonal grazing (i.e., grazing an area during the same season every year) or from over utilization during extended drought periods. The potential vegetation is made up of approximately 70- 85 percent grasses and grass-like species, 10-15 percent forbs, and 5-10 percent shrubs. The dominant grasses include

blue grama, buffalograss, and western and/or thickspike wheatgrass. Other grasses may include green needlegrass, prairie junegrass, and Sandberg bluegrass. Significant forbs include scarlet globemallow, wild parsley, biscuitroot, phlox, golden pea, deer vetch, asters, and milkvetch. The significant shrubs that occur include big sagebrush, cactus, broom snakeweed and rose.

Blue Grama/Buffalograss Sod

This plant community develops under heavy continuous season-long grazing, and with continuous seasonal grazing with

concentrated use in the early part of the growing season (as in calving/lambing pastures). It is made up of approximately 75-90% grasses (primarily short, warm season grasses), 5-10% forbs, and 5-15% shrubs. The dominant grasses include blue grama and buffalograss. Other grasses may include western wheatgrass, prairie junegrass, threeawn, and annual brome. The dominant forbs include slimflower scurfpea, pussytoes, curlycup gumweed and scarlet globemallow. The dominant shrub is plains pricklypear.

Dense Clay**Ecological Dynamics of the Site**

This site developed under Northern Great Plains climatic conditions, natural influences of large herbivores, occasional fire, and other biotic and abiotic factors that typically influence soil/site development. Changes will occur in the plant communities due to short-term weather variations, impacts of native and/or exotic plant and animal species, and management actions. While the following plant community descriptions describe more typical transitions between communities that will occur, severe disturbances, such as periods of well-below average precipitation, can cause significant shifts in plant communities and/or species composition. Green needlegrass is more prevalent in the western portions of the MLRA, and partially replaces the wheatgrasses.

Encroachment may occur from associated sites. Black greasewood, winterfat and saltbush may occur on areas that are higher in salt content. These are typically drier areas in association with the Saline Upland ecological site (e.g., west of Highway 85 in Butte County, SD). Slickspots are associated with Swanboy and Wasa soils. Slickspots are bare ground areas that are affected by high sodium concentrations. The soil factors are the dominant influence and grazing management does not affect these areas.

These soils are high in clay and have a low available water capacity. The shrink-swell potential is very high, resulting in cracks greater than 2 inches wide during dry periods. The native wheatgrasses with their strong rhizomes and high drought tolerance are able to thrive in these soils. Wheatgrasses dominate the site and production is closely related to the vigor of the native wheatgrass.

The plant community upon which interpretations are primarily based is the Historic Climax Plant Community (HCPC). The HCPC has been determined by studying rangeland relic areas, areas protected from excessive disturbance, and areas under long-term rotational grazing regimes. Trends in plant community dynamics ranging from heavily grazed to lightly grazed areas, seasonal use pastures, and historical accounts also have been used. Plant communities, states, transitional pathways, and thresholds have been determined through similar studies and experience.

Plant Communities of the Site**Wheatgrass (HCPC)**

The plant community upon which interpretations are primarily based is the Wheatgrass Plant Community. This is also considered the Historic Climax Plant Community (HCPC). This plant community can be maintained

with prescribed

grazing, prescribed burning, or areas receiving occasional short periods of deferment. The potential vegetation is about 80-90% grasses or grass-like plants, 5-10% forbs, and 5-10% shrubs. Cool season grasses dominate the plant community. Major grasses include native wheatgrass such as western wheatgrass, Montana wheatgrass and thickspike wheatgrass. The plant diversity is low, being dominated by the wheatgrasses. Other grasses and grass-like species occurring on the plant community may include native bluegrasses, buffalograss, blue grama and sedge. The dominant forbs include biscuitroot, wild parsley, scarlet globemallow, and western yarrow. Shrubs that may occur on the plant community include big sagebrush, cactus, greasewood, saltbush, birdfoot sagebrush and winterfat. In the central to

eastern portions of the MLRA, greasewood will decrease with grazing pressure, while in the western portion greasewood encroaches from adjacent sites and will increase with grazing pressure.

This plant community is resilient and well adapted to the Northern Great Plains climatic conditions. However two to three years of drought can greatly reduce the vigor and abundance of the green needlegrass and wheatgrasses, increasing the percent bare ground and creating moderate to high soil erosion potential. The actual plant composition may not be greatly changed, however the production and viability of the site has greatly changed. With a few years of average to above average precipitation, the plant community will make a fast recovery. If disturbed, dense clays are resilient.

Western Wheatgrass, Bare Ground

This plant community develops under droughty conditions, heavy spring grazing or long-term heavy continuous grazing.

The potential vegetation is made up of 70-85% grass, 10-20% forbs and 0-10% shrubs. The grass component is almost entirely native wheatgrasses. Other perennial grasses are generally not found. Forbs found in this plant community include pennycress, annual mustards, curlycup gumweed and sweet clover. Generally the shrub component has dropped out.

Thin Upland

Ecological Dynamics of the Site

This site developed under Northern Great Plains climatic conditions, natural influences of large herbivores, occasional fire, and other biotic and abiotic factors that typically influence soil/site development. Changes will occur in the plant communities due to short-term weather variations, impacts of native and/or exotic plant and animal species, and management actions. While the following plant community descriptions describe more typical transitions between communities that will occur, severe disturbances, such as periods of well-below average precipitation, can cause significant shifts in plant communities and/or species composition.

Encroachment of ponderosa pine, Rocky Mountain juniper and eastern redcedar may occur from associated sites, and can shift site characteristics. These shifts can alter the site dynamics and potential. These species may occur in small amounts on several plant communities.

Plant Communities of the Site

Needlegrass/Grama/Little Bluestem - Community Phase 4.1

The plant community upon which interpretations are primarily based is the Needlegrass/Grama/Little Bluestem Plant Community. This is also considered to be the Historic Climax Plant Community (HCPC). This plant community can be

found on areas that are properly managed with grazing and/or prescribed burning, and on areas receiving occasional short periods of deferment. The potential vegetation is about 75-85% grasses or grass-like plants, 5-15% forbs, and 5-10% shrubs. A mixture of cool and warm season grasses dominates the plant community. Major grasses include little bluestem, needleandthread, sideoats grama and blue grama. Other grasses and grass-like species occurring include sedge,

western wheatgrass, green needlegrass and prairie junegrass. Significant forbs include purple coneflower, dotted gayfeather and prairie clover. Significant shrubs found in this plant community include fringed sagewort, rose and yucca.

Blue Grama/ Sedge - Community Phase 2.3

This plant community is a result from heavy grazing over many years. Diversity is diminished, as the short grasses become dominant in the plant community. The grazing tolerant blue grama and sedges replace little bluestem, western wheatgrass and the needlegrasses. Sideoats grama remains in the plant community, but is less productive because of competition and grazing pressure. Due to low palatability, cudweed sagewort, milkvetch, heath aster and green sagewort become more prevalent in the plant community. Fringed sagewort is the dominant shrub in this plant community. The potential vegetation is about 75-85% grasses or grass-like plants, 5-15% forbs, and 5-10% shrubs.

Little Bluestem/ Grama - Community Phase 3.2

This plant community develops under continuous seasonal grazing or continuous season-long grazing and a low fire frequency. This plant community can also result from extended periods of non-use and no fire. Little bluestem dominates

this plant community, as it takes advantage of soil disturbance (resulting from hoof action, or increased bare ground due to reduced plant vigor under non-use and no fire).

Other significant grasses or grass-likes include blue grama, sideoats grama and sedge. Forbs commonly found in this plant community include cudweed sagewort, purple coneflower and dotted gayfeather. Significant shrubs include fringed sagewort and rose. The potential vegetation is about 80-90% grasses or grass-like plants, 5-10% forbs, and 5-10% shrubs. Although production remains relatively high, little bluestem plants often become “wolfy” and largely unavailable to most herbivores. This plant community is moderately resistant to change. The herbaceous species present are well adapted to grazing; however, species composition can be altered through long-term overgrazing. If the herbaceous component is intact, it tends to be resilient if the disturbance is not long-term.

Loamy

Ecological Dynamics of the Site

This site developed under Northern Great Plains climatic conditions, natural influences of large herbivores, occasional fire, and other biotic and abiotic factors that typically influence soil/site development. Changes will occur in the plant communities due to short-term weather variations, impacts of native and/or exotic plant and animal species, and management actions. While the following plant community descriptions describe more typical transitions between communities that will occur, severe disturbances, such as periods of well-below average precipitation, can cause significant shifts in plant communities and/or species composition.

The plant community upon which interpretations are primarily based is the Historic Climax Plant Community (HCPC). The HCPC has been determined by studying rangeland relic areas, areas protected from excessive disturbance, and areas under long-term rotational grazing regimes. Trends in plant community dynamics ranging from heavily grazed to lightly grazed areas, seasonal use pastures, and historical accounts also have been used. Plant communities, states, transitional pathways, and thresholds have been determined through similar studies and experience.

Plant Communities of the Site

Western Wheatgrass/Needlegrass

The interpretive plant community for this site is the Western Wheatgrass/Needlegrass Plant Community. This is also considered the Historic Climax Plant Community (HCPC). This plant community can be found on areas that are properly managed with grazing and/or prescribed burning, and sometimes on areas receiving occasional short

periods of deferment.

The potential vegetation is about 80-90% grasses or grass-like plants, 5-10% forbs, and 1-10% shrubs. Cool season grasses dominate this plant community. The major grasses include western wheatgrass, needleandthread and green needlegrass. Other grasses occurring on the site include blue grama, big bluestem, sideoats grama, prairie junegrass, buffalograss and sedge. Significant forbs include scarlet globemallow, prairie coneflower, purple prairie clover, penstemon, American vetch, and milkvetch. The significant shrubs that occur include big sagebrush, leadplant, snowberry, winterfat and rose.

Blue Grama/Western Wheatgrass

This plant community develops under continuous seasonal grazing (i.e., grazing an area during the same season every year) or from over utilization during extended drought periods. The potential vegetation is made up of approximately 75- 85% grasses and grass-like species, 5-15% forbs and 1-10% shrubs. The dominant grasses include blue grama and western wheatgrass. Other grasses may include sedge, buffalograss, needleandthread and prairie junegrass. Significant forbs include scarlet globemallow, scurfpea, western ragweed and green sagewort. The dominant shrubs that occur include cactus, broom snakeweed, fringed sagewort and rose.

Compared to the Historic Climax Plant Community, the shortgrass species including blue grama and threadleaf sedge have increased. The cool season species including western wheatgrass and green needlegrass have decreased in composition. Annual bromes, curlycup gumweed, sweetclover and other annual grasses and forbs can invade the site. This plant community can have the appearance of a mosaic, with sod and mixed grass communities intermingled.

Blue Grama/Buffalograss Sod

This plant community develops under heavy continuous season-long grazing, or with continuous seasonal grazing with concentrated use in the early part of the growing season (as in calving/lambing pastures). It is made up of approximately 75-85% grasses (primarily short, warm season grasses), 5-20% forbs, and 1-10% shrubs. The dominant grasses include blue grama and threadleaf sedge. Other grasses may include western wheatgrass, prairie junegrass, buffalograss, threeawn, and annual brome. The dominant forbs include western ragweed, green sagewort, cudweed sagewort and scarlet globemallow. The dominant shrubs include fringed sagewort, cactus and broom snakeweed.

Saline Upland

Ecological Dynamics of the Site

This site developed under Northern Great Plains climatic conditions, natural influences of large herbivores, occasional fire, and other biotic and abiotic factors that typically influence soil/site development. Changes will occur in the plant communities due to short-term weather variations, impacts of native and/or exotic plant and animal species, and management actions. While the following plant community descriptions describe more typical transitions between communities that will occur, severe disturbances, such as periods of well-below average precipitation, can cause significant shifts in plant communities and/or species composition.

The high salt content and hydrology properties greatly influence the vegetation of this site. This site tends to influence the vegetation of surrounding sites, but surrounding sites have little influence on it. Wheatgrasses and desirable shrubs such as Gardner's saltbush and winterfat are the dominant species on this site. As it declines from mismanagement (over grazing or lack of recovery periods) species such as inland saltgrass, greasewood, woody aster and annuals will increase. Grasses such as Indian ricegrass, alkali sacaton, and wheatgrasses, and desirable shrubs such as saltbush and winterfat decrease. Sweet clover tends to invade the site.

Plant Communities of the Site

Wheatgrass/Saltbush (HCPC)

The plant community upon which interpretations are primarily based is the Wheatgrass/Saltbush Plant Community. This is also considered the Historic Climax Plant Community (HCPC). Potential vegetation is about 45-70% grasses or grass-like plants, 2-10% forbs, and 25-45% shrubs. Saline tolerant shrubs such as Gardner's saltbush, and winterfat dominate. Major grasses include rhizomatous wheatgrasses, inland saltgrass, alkali sacaton, and Indian ricegrass. Other grasses occurring include bottlebrush squirreltail and Sandberg bluegrass. This plant community provides valuable winter grazing for wildlife and domestic livestock.

This plant community is sensitive to management. Only plants that are adapted to high salt conditions comprise this site. Reduction in vigor and abundance of the desirable species (wheatgrasses, alkali sacaton, Indian ricegrass, Gardner's saltbush and winterfat) results in the loss of forage quantity and quality. These plants will generally be replaced by saltgrass. As the dominant desirable plant community declines this also creates more bare ground. The increase in bare ground will increase the susceptibility to soil erosion and invasive forbs such as sweet clover. Plant litter is properly distributed with some movement off-site and natural plant mortality is low.

Forb/Saltgrass

This plant community typically occurs more often in the western portion of the MLRA. Currently this plant community is found under moderate, season-long grazing by livestock. Greasewood, woody aster, cheatgrass and bare ground are a major part of this plant community. Sparse saline tolerant grasses make up the majority of the understory with the balance made up of annual cool-season grass, and miscellaneous forbs.

Dominant grasses include inland saltgrass, Sandberg bluegrass, and squirreltail. Other grasses that occur include threadleaf sedge, prairie junegrass and blue grama. Forbs commonly found in this plant community include hairy.

goldaster, goldenpea, curlycup gumweed, broom snakeweed, and scarlet globemallow. Plains pricklypear and winterfat can also occur. Depending on precipitation and climatic factors various invasive forbs, such as sweetclover, will dominate the site.

Subirrigated

Ecological Dynamics of the Site

This site developed under Northern Great Plains climatic conditions, natural influences of large herbivores, occasional fire, and other biotic and abiotic factors that typically influence soil/site development. Changes will occur in the plant communities due to short-term weather variations, impacts of native and/or exotic plant and animal species, and management actions. While the following plant community descriptions describe more typical transitions between communities that will occur, severe disturbances, such as periods of well-below average precipitation, can cause significant shifts in plant communities and/or species composition.

Plant Communities of the Site

Big Bluestem/Prairie Cordgrass

The plant community upon which interpretations are primarily based is the Big Bluestem/Prairie Cordgrass Plant Community. This is also considered to be the Historic Climax Plant Community (HCPC). This plant community can be found on areas where grazed plants receive adequate periods of deferment during the growing season in order to recover. Historically, fires occurred infrequently. The potential vegetation is about 80-90 percent grasses and grass-like, 5-10 percent forbs, and 0-10 percent shrubs. Tall and mid warm season grasses dominate this community. Major grasses include big bluestem, prairie cordgrass and switchgrass. Other grasses and grass-like occurring on the community include western wheatgrass, Canada wildrye, Baltic rush, spikerush, and bulrush.

Key forbs and shrubs include American licorice, Maximilian sunflower, milkvetch, and willow.

Cool-season Dominant

This plant community developed under frequent and severe defoliation without periodic deferment. Big bluestem, prairie cordgrass, Indiangrass, switchgrass, and Canada wildrye have been significantly reduced. Western wheatgrass will increase, while Kentucky bluegrass will begin to invade. Non-palatable forbs such as heath aster and ironweed have increased. Palatable forbs and shrubs are still present in small amounts. This plant community is at risk of losing tall warm season grasses, palatable forbs, and shrubs.

Decadent Plants, Excessive Litter

This plant community occurs after an extended period of non-use, and where fire has been eliminated. The dominant plants tend to be similar to those found in the HCPC, however in advanced stages, frequency and production can be lower. Litter amounts have increased causing plants to become decadent. Much of the plant nutrients are tied up in excessive litter. Organic matter oxidizes in the air rather than being incorporated into the soil due to the absence of animal impact. Typically, bunchgrasses develop dead centers and rhizomatous grasses (prairie cordgrass) form small colonies because of a lack of tiller stimulation.

Kentucky Bluegrass Sod

This plant community developed with further frequent and severe defoliation. The plant community is predominantly cool season grasses and grass-like. Kentucky bluegrass has fully invaded the community and persists in a sod-bound condition. Baltic rush, various sedges, and foxtail barley have increased. Remnant amounts of western wheatgrass may still persist in localized colonies. Big bluestem, prairie cordgrass, and switchgrass have been removed. Forbs such as kochia and Russian thistle have also increased.